Project Budgeting… *Page 3* • **Eligible Cost Itemization and Categorization…** *Page 7* • **Best Practices Report…** *Page 11* • **More Inside…**

Breaking Ground

The OPSC/DSA Connection to California School Districts

State of California • Department of General Services

A PUBLICATION OF THE DIVISION OF THE STATE ARCHITECT AND THE OFFICE OF PUBLIC SCHOOL CONSTRUCTION **FALL 2003**

a letter from

Stephan Castellanos & Luisa M. Park

Project budgeting is one of the most critical elements of the design and construction process. Overlooking costs early in planning can lead to unpleasant surprises as the project progresses. Good planning and budgeting are essential. With that in mind, we present this Fall 2003 issue of *Breaking Ground* featuring articles that we hope will provide valuable information on understanding and planning a new construction budget.

The feature article "Project Budgeting" is designed to help you understand the components of a project budget, as well as taking a look at historical new construction data that may be useful when developing reasonable approximations of what a school will cost. The side-bar article on page 4 entitled "Understanding the Numbers" shares insights on the percentages and characteristics of the historical data provided in the feature article. "Itemizing and Categorizing Eligible Project Costs" is another companion article in which the Office of Public School Construction (OPSC) has assembled an itemization of expenses that are commonly encountered on a school construction project funded from the School Facility Program (SFP), which you may want to use as a guide.

"Sustainability, Creativity, and Cost-Savings" are vital components to build into project budgets, and the Division of the State Architect (DSA) shares information in an article on this topic to clear up perception versus reality about high performance schools. In this article you can find out how high performance schools can reduce costs in the short term and provide maintenance and operations savings far into the future. Under the SFP, your project may be eligible for an additional grant for energy efficiency. On page 2 in the article entitled "Energy Efficiency Funds" further details are provided on this opportunity.

On page 11, "Best Practices Report" provides an overview of several comprehensive sources of information available through the OPSC to support and guide school districts and other stakeholders as they build and retrofit schools. The report, available on the OPSC Web site, provides information on a variety of methods and best practices of school facility construction. One of those best practices is the re-use of approved plans. This concept is further explored in this issue of *Breaking Ground* on page 6 in the "Re-Use of Plans May Equate to Cost Savings" article.

This issue's Featured Project is an example of a re-use of plans by the Elk Grove Unified School District and Stafford King Wiese Architects. The design for this beautiful school, Union House Elementary, was used five times which helped this district keep up with the growth in its part of the State. Yet as you will see, the re-use of the plans did not prevent the district from addressing unique program requirements.

Accurately estimating certain fees can help to develop an accurate overall project cost estimate. The article "DSA Fees—You Can Estimate Them Yourself" explains the types of fees charged and provides DSA Web site information that can be used to calculate estimated fees.

We sincerely hope this edition of *Breaking Ground* will provide valuable information useful for successful planning of your project budget. As always, we welcome you to contact the Editorial Group at **breaking.ground@dgs.ca.gov** to share your ideas and suggestions.

Stephan Castellanos, FAIA
State Architect, Division of the State Architect

Luisa M. Park
Executive Officer, Office of Public School Construction

OPSC Reminders. . .

2003 State Allocation Board Meetings*
- Wednesday, September 24
- Wednesday, October 22
- November/December TBD

2003 Implementation Committee Meetings*
- Wednesday, October 3
- Friday, November 7
- Friday, December 5

Regional Occupational Center Facilities Report (Form SAB 406R)
Due triennially (September 1, 2003) districts must report on the facilities utilized for the operation of a regional occupational center or program per Education Code Section 17285(d).

SFP Joint Use Funding Cycle
The filing dates for the SFP Joint Use Program are June 1, 2003 through May 31, 2004 to be apportioned July 2004 or July 2005.

LPP Joint Use Funding Cycle
The filing dates for the Lease-Purchase Program Joint Use Program (SB 1795) have been extended for another year and are June 1, 2003 through May 31, 2004 to be apportioned July 2004.

Interest Earned Report (Form SAB 180)
Due quarterly (March 31, June 30, September 30 and December 31) from each county for all districts which have earned interest from the Leroy F. Greene Lease-Purchase Fund.

* Meeting dates, times and locations are subject to change. For the latest meeting information, check the OPSC Web site at www.opsc.dgs.ca.gov.

State of California • Department of General Services

Breaking Ground

The OPSC/DSA Connection to California School Districts

Editorial Group:
Bruce Hancock, SAB
Lori Morgan, OPSC
Carol Shellenberger, OPSC
Elena Tarailo, DSA
John Vester, DSA

Layout and Design:
Office of Public School Construction

Send your comments to *Breaking Ground* at:
breaking.ground@dgs.ca.gov

DSA • 1130 K Street • Suite 101
OPSC • 1130 K Street • Suite 400
Sacramento, CA 95814

DSA Forecasting Prop 47 Review

To date, Proposition 47 is the largest state school facility bond to be passed by voters in the history of our state and in the nation. To successfully meet the Proposition's funding and timeline parameters, greater collaboration and stronger partnerships have formed between school districts, school design and construction professionals, the Department of Education, Department of Toxic Substances Control, the Office of Public School Construction, and the Division of the State Architect (DSA). Early-on, all partners realized the need for a comprehensive assessment of the entire process, beginning with project inception and culminating with State Allocation Board approval.

To build success into the growing number of new (and modernized) school projects, DSA needed reliable data to estimate the timing for submittals and the amount of estimated workload over the next several months. DSA needed a tool to "gauge" the number and size of projects for review and approval, as well as estimated submittal dates to assess how Proposition 47 would affect its overall operations. To secure the data, DSA reached out to one of its key stakeholder groups—public school districts throughout California.

Thanks to the expertise of the Department of General Services' Energy Management Division staff, a survey was designed for DSA earlier this year. The purpose of the survey was to contact school districts, request their assistance in determining the number and size of projects they plan to submit to DSA, and the estimated month each project will be submitted to DSA for processing and approval.

The survey was conducted earlier this year through DSA's Operations Team. Dennis Bellet and DSA's Regional Managers Jack Bruce, Nat Chauhan, Dan Levernier, and Mahendra Mehta personally participated in the survey process to ensure timely turnaround. DSA is using these workload projections to plan for and track the completion of projects that will be funded by Proposition 47.

Energy Efficiency Funds

Does your new construction or modernization project qualify for an additional SFP grant for energy efficiency?

If you are planning a School Facility Program (SFP) new construction or modernization project, you may consider applying for an additional grant for energy efficiency when certain criteria are met and the proposed facilities in the project exceed specified energy efficiency standards by at least 15 percent for new construction, or by at least 10 percent for modernization.

Specific details may be viewed in the SFP Regulations, Sections 1859.71.3 and 1859.78.5, located on the OPSC Web site at **www.opsc.dgs.ca.gov**. Questions may be directed to Steve Paul, Office of Public School Construction Programs Supervisor, at 916.322.1838, or your OPSC Project Manager.

Project Budgeting

Project budgeting is an essential step to a successful new construction project. Even a very preliminary budget can be indispensable to the early planning process. Overlooking costs early in planning can lead to unpleasant surprises as the project progresses. It's one thing to understand the total amount of funding that will be available for the project, but it's another to understand how much must be dedicated to the dozens of different categories of project costs that will be encountered before move-in day. The project will be much more than architect fees, construction costs and site acquisition funding. In fact, until the planner has a solid understanding of the items and expenses that will make up all of the project costs, it's not possible to even know how much funding will be available for the construction of the facility. Without knowing even that basic number, the district has no idea of the design budget to convey to the design professional.

Backing into a project budget is a sure road to cost overruns and funding shortfalls. If a district has $10 million available for the 'construction' of a project, and authorizes a design that will require $9 million in construction contract costs, trouble is just down the road. The remaining $1 million will not fund the balance of the project, but that may not become apparent until expensive design work is complete or, worse yet, until the contract is underway. With hundreds of thousands of dollars or more already committed or under contract, it will be too late to easily alter course. Caught in this position, the district may elect to forge ahead, watching each passing day result in deeper and deeper debt. It's an unpleasant and all too common scenario.

The problem of haphazard and incomplete budgets is exacerbated by the fact that there is no universally accepted budget format or guide for school districts to follow. Each district is on its own, dependant entirely on the expertise of its staff or consultants. The result is that every district approaches the problem differently, often without success. So, how can the facility planner who has not constructed multiple projects in the last few years independently construct a reasonable project budget? Two steps may start that process in the right direction. First, understand the components of a project, and second, use historical data to develop reasonable approximations. After that, constant refinement of the budget in close collaboration with the design professional will naturally progress with the development of the project. The most important step will have already been accomplished in the very beginning of the entire process: a realistic understanding of the probable total cost of the project.

To help with those first important steps, the Office of Public School Construction (OPSC) has assembled a checklist of the types of expenses that a typical new construction project is likely to incur. That list can be found later in this article, and in more detail in this issue in the article entitled, "Itemizing and Categorizing Eligible Project Costs." The OPSC has also culled data from projects constructed under the Lease-Purchase Program. This older program was used because it depended on a line-item method of funding and, therefore, created a comprehensive record of expenses broken into relatively distinct categories. To determine what percent of the project budget has historically gone into each budget element, the OPSC summarized data from more than a hundred new construction school projects, which bid in 1996 and 1997. Since site acquisition costs varied significantly from location to location, they were not included. Obviously, the actual costs of the construction of those projects would be out of date today, but the percentage of each category of cost relative to the total cost is still relevant and applicable.

Identifying the Parts

The typical project budget consists of three basic parts: 1) site acquisition costs, 2) consultant services (soft) costs, and 3) construction (hard) costs. Each is comprised of various subparts. The following is a typical list of the line items that should be included in the district's project budget. The actual list will vary from project to project, but this is a good starting point.

Site Acquisition Costs
- Land Purchase Costs
- Real Estate Fees
- CEQA Mitigation Costs
- Legal Fees
- CEQA Preparation

Hard Costs
- Site Improvement Costs
- Building Construction Costs
- Furniture & Equipment Costs

Soft Costs
- Project Management Fees
- Legal Fees
- Financing Costs
- A/E Design Fees
- Special Consultants Fees
- Geotechnical Fees
- Testing & Inspection Costs
- Permits
- Construction Management Fees
- Contingency Allowances

A more detailed list, organized according to the funding categories of the current School Facility Program, can be found in the article entitled "Itemizing and Categorizing Eligible Project Costs" on page 7.

Continued on next page

erstanding Numbers

There are a few things to know about the percentages contained in this article. As already noted, the figures come from one hundred selected projects in the Lease Purchase Program. Because of that, the data has certain characteristics that should be understood and factored into the use of the information.

The Lease-Purchase Program used a system of allowances to develop total project funding. For instance, a calculation was made on the amount of funding that would be included for furniture and equipment. If the district elected to supplement that amount with its own funds, the State data would not show the additional expenditures. Thus the charts showing the percentage of the project spent on furniture and equipment actually shows the amount reported to Office of Public School Construction as eligible expenditures. A similar situation existed for Architect's fees and contingency calculations.

On the other hand, some costs were not 'capped' by calculation. For instance, site work and tests and inspections were eligible to the full extent that they occurred. As a result, the charts reflect actual costs not influenced or distorted by allowances.

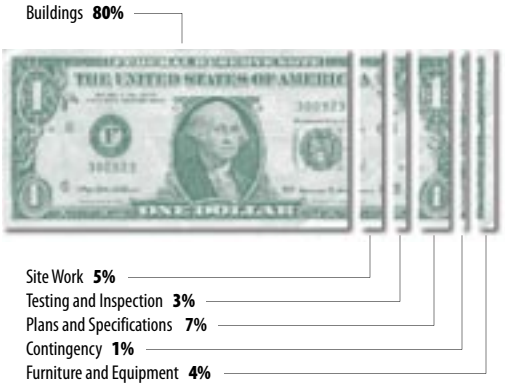
In spite of these potential influences, the percentages can be a relevant and useful guide to understanding the major components of any school project and their relative cost. Used in that way, the planner can build similar preliminary budgets.

Project Budgeting... continued from page 3

So How Much Does A School Cost?

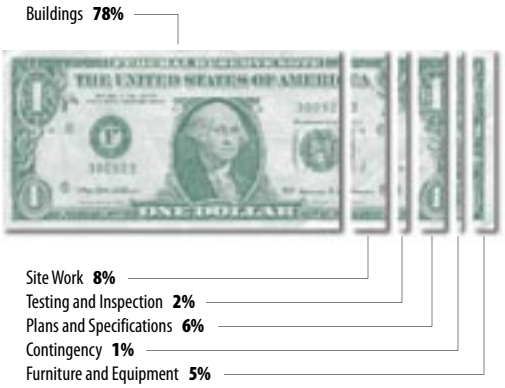
The question is often asked but seldom answered. The information that follows may help answer that question to some degree, and, more importantly, identify the average cost distribution of more than 100 projects.

Average Cost Distribution for 58 Elementary Schools



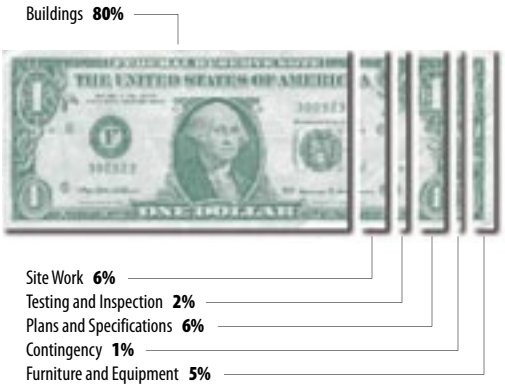
- The average area per elementary school student was 62 sq ft.
- The average cost per square foot of elementary school was $182/sq ft.
- The average cost per elementary school student was $11,300.
- The average cost per elementary school classroom was $282,200.

Average Cost Distribution for 27 Middle Schools



- The average area per middle school student was 80 sq ft.
- The average cost per square foot of middle school was $187/sq ft.
- The average cost per middle school student was $15,000.
- The average cost per middle school classroom was $374,800.

Average Cost Distribution for 38 High Schools



- The average area per high school student was 90 sq ft.
- The average cost per square foot of high school was $200/sq ft.
- The average cost per high school student was $18,000.
- The average cost per high school classroom was $484,400.

Remember, the information in the charts above is influenced by several factors:

- The data does not included costs beyond the 'eligible' program costs.
- Site acquisition costs are not included.
- The costs may be skewed by the allowances of the program.

See the sidebar article "Understanding the Numbers" for more information.

Project Budgeting. . .

Detailed Numbers

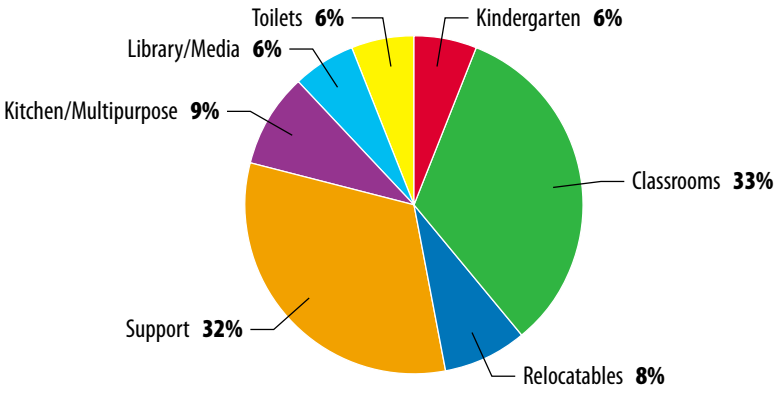
The following numbers present a more detailed look at the hard costs of two elementary schools. They were selected from the same group of 58 elementary schools to illustrate their space utilizations as well as overall costs in terms of dollars per gross square footage ($/gsf) and dollars per student ($/student). The projects were also built under the old LPP. However, the data is from the architect's record of final costs and has been analyzed to find out why there is a cost difference. The number of students shown has been changed to equal 25 students per classroom, to better relate the cost per student to the new SFP. The costs are actual and have not been adjusted for inflation.

Citrus Elementary School

The information for this school was provided by Fontana Unified School District and HMC Architects.

Bid Date	May 20, 1998
Grade Level	K–5
Pupil Capacity	525
Site Acreage	12.7
Gross Square Footage (GSF)	42,724
Teaching Stations	21
GSF/Pupil	81
Buildings	$5,135,484 – $120/gsf
Site Costs	$1,540,516 – $ 36/gsf
Total Costs	$6,676,000 – $156/gsf
Cost per Student	$12,716

Space	Sq Ft
Kindergarten	2,748
Classrooms	13,946
Relocatables	3,600
Support	13,461
Kitchen/Multipurpose	6,721
Library/Media	4,018
Toilets	2,481
Total Square Footage	42,724

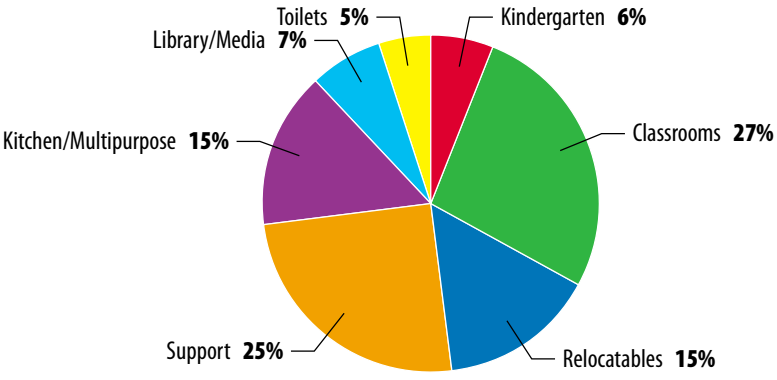


San Joaquin Elementary School

The information for this school was provided by Stockton Unified School District and Stafford, King, Wiese Architects.

Bid Date	May 7, 1998
Grade Level	K–6
Pupil Capacity	550
Site Acreage	9
Gross Square Footage (GSF)	43,554
Teaching Stations	22
GSF/Pupil	79
Buildings	$5,120,000 – $118/gsf
Site Costs	$1,741,300 – $ 40/gsf
Total Costs	$6,681,300 – $158/gsf
Cost per Student	$12,475

Space	Sq Ft
Kindergarten	2,428
Classrooms	11,520
Relocatables	6,720
Support	10,816
Kitchen/Multipurpose	6,721
Library/Media	3,056
Toilets	2,293
Total Square Footage	43,554



Continued on next page

DSA Reminders...

DSA Advisory Board Quarterly Meeting will be held on September 25-26, 2003 (location to be determined).

2003 Division of the State Architect Project Inspector Examination Schedule (conducted monthly in Sacramento and Ontario):

- October 15
- November 19

For additional information about the Inspector Program, please see the Web site at www.dsa.dgs.ca.gov/InspectorInfo.

Project Budgeting... continued from page 5

Comparing the Two

The numbers for the two projects are nearly identical in cost per square foot and in cost per student. Yet, they are considerably different in plan layout, material and systems design. One is a very simple plan configuration and the other is a more complicated arrangement of small building pods. One is wood frame, and the other is steel frame.

Analyzing the costs in detail reveals numerous differences not apparent at the summary level. In simple terms, the project with the more expensive building shape used the less expensive building materials and systems. As might be expected, the architects both worked to the maximum state allowances but arrived at the solution in differing ways.

This article includes excerpts from the "Project Budgeting" section of the *Public School Construction Cost Reduction Guidelines*. The publication in its entirety is available on the Office of Public School Construction's Web site at www.opsc.dgs.ca.gov.

Re-Use of Plans May Equate to Cost Savings

"The largest appeal for plan re-use is that it saves time in plan preparation and regulatory reviews. Saving time translates into saving money."

Re-use of approved plans will help school districts when they are faced with school construction projects that are on the "fast track", especially in a tense budget climate where there is increased pressure to reduce overall construction costs. The primary goal of this article is to give *Breaking Ground* readers useful information on this non-traditional method for the delivery of school construction projects in a timely manner with less cost, enhancing construction quality and perhaps enhancing the quality of education through these school facilities.

Everyone associated with the construction of school facilities in California has some experience with the re-use of plans. The most common use of this concept is re-use of Pre-Checked (PC) plans, primarily for relocatable buildings, lunch shelters, and other structures used over and over again. For traditional buildings the re-use of plans began when the district-architect team chose to use an approved set of plans for more than one campus. Sometimes the plans are changed very little, especially when two campuses are built in the same year. Most of the time the plans are updated to take into account knowledge gathered during post occupancy evaluations and code changes since the completion of the first project. Items that caused change orders are corrected on the original plans before the next re-use. Lessons learned during each project are incorporated in the next project improving the results each time. The largest appeal for plan re-use is that it saves time in plan preparation and regulatory reviews. Saving time translates into saving money. Although "hard data" is not presently available, it is generally believed that plan re-use may save a school district anywhere from

Continued on page 10

Itemizing and Categorizing Eligible Project Costs

Developing a budget for a new construction project that will be funded from the School Facility Program means understanding how that funding is developed and categorized. That's important because some project costs must come out of a fixed base grant calculation, and other costs are determined by the design professional's pre-construction estimates, with the concurrence of the Office of Public School Construction.

An itemization of expenses that are commonly encountered on a school construction project follows. It can help the district facility manager both as a checklist of likely project costs and as a guide to which costs must be taken from the base grant.

Also refer to **Glossary of Acronyms and Terms** on page 8 and **Resources** on page 12.

Base Grant

This is the "per pupil grant" specified in law. It is adjusted for geographic location, small size projects, new school projects, and urban cost. The current grant amounts can be found on the OPSC Web site at www.documents.dgs.ca.gov/opsc/pdf-prgms/summary_sfp_grants.pdf.

The following costs, when encountered on a school construction project, are considered to be included in the base grant.

- Architectural and Engineering Fees
- DSA Plan Review Fees
- CDE Plan Review Fees
- Energy Analysis Fee
- Printing and Reproduction
- Base Building Construction Costs
- General Site Development
  - Finish Grading
  - On-site roads and Drives, Walks
  - Stairs and Ramps not eligible under Service Site
  - Concrete V Gutters
  - Planting, Sprinkling
  - Playground Equipment
  - Athletic Stadiums, Fields, and Equipment.
  - Surface Drainage
  - Fencing, Outdoor Walls, Utility Enclosures
- Construction Testing
- Construction Inspection
- Contingency
- Furniture and Equipment
- COC Insurance
- Project and Construction Management Fees

Additional Grants

The basic grant is supplemented when special circumstances warrant. When any of the following exist in a project, the basic grant will be increased.

- Multilevel Construction
- Replacement of Single Story With Multilevel (AB 801)
- Mandated Fire Sprinkler and Alarm Costs
- SDC Therapy
- Project Assistance (Small District Administrative Costs)
- Labor Compliance Program

Site Development

Site development costs are always unique to a specific project. They are developed through a process by which the design professional identifies the necessary work and estimates the costs. The cost estimates are reviewed by OPSC and, once agreement is reached on the appropriate amounts, the costs are added to the project funding.

- Service Site
  - Clear and Grub
  - Demolition of Existing Buildings and Improvements
  - Removal and Rerouting of Existing Utilities
  - Rough Grading, Cut and Fill
  - Compaction
  - Drainage
  - Erosion Control
  - Outside Stairs, Ramps and Retaining Walls (Slopes > 1:2, higher than 6')
  - Fire Code Requirements
  - Multilevel Parking Structures
  - Removal and Relocation of Existing Portables
- Off Site Development
  - Curbs, Gutters and Street Paving
  - Sidewalks
  - Street Lighting, Planting areas, Street Signs, Traffic Signals, Trees
  - City, County, and Special District Fees
  - Storm Drains
  - Pedestrian Safety Paths
- Utility Services
  - Water
  - Sewage
  - Gas
  - Electric
  - Communication Systems
  - Capital Development Fees (Connection Fees) for all of the above

Continued on page 8

Itemizing and Categorizing Eligible Project Costs. . . continued from page 7

Site Acquisition

If an application contains a request to purchase a new site or acquire more land to add to an existing school, the project is eligible for some or all of the following additional funding. Unlike service site costs, the funding for these costs must come out of a calculated amount usually based on a percentage of the appraised value of the property to be acquired. The exception to this is the amount for relocation expenses, which will be determined based on the estimated costs.

- Site Acquisition Costs
- Preliminary Site Testing
- Preparation of PEA and POESA
- DTSC review, approval, and oversight of PEA and POESA
- Preparation and Implementation of the PEA and POESA
- DTSC review, approval, and oversight of Preparation and Implementation of RA
- CEQA Compliance
- Appraisal Fees
- Site Acquisition Legal Fees
- Escrow Fees
- Title Fees
- Relocation
- CDE Site Approval Process

Glossary of Acronyms and Terms

The following are State agencies and terms the Office of Public School Construction utilize during its review process:

CEQA—California Environmental Quality Act. This act is to inform governmental decision makers and the public about potential environment impact of proposed activities.

CDE—California Department of Education. The State agency that is responsible for school facility matters and is referenced in Section 1859.2 of the SFP regulations.

DSA—Division of State Architect (Department of General Services).
This office reviews school plans and specifications for State compliance under the provisions of Title 24.

DTSC—Department of Toxic Substance Control. This Department reviews and approves school sites that meet the Health and Safety Codes, Section 25356.1.

OPSC—Office of Public School Construction. This office, as staff to the State Allocation Board, implements and administers the School Facility Program and other programs of the SAB.

PEA—Preliminary Endangered Assessment. Is defined in California Education Code Section 17210(h), "Means an activity that is performed to determine whether current or past hazardous material. . . waste management practices. . . pose a threat to children's health. . . ."

POESA—Phase One Environmental Site Assessment. Is defined in California Education Code Section 17210(g), "Preliminary assessment of a property to determine whether there has been. . .a release of hazardous materials. . . ."

RA—Response Action. The removal of hazardous materials and solid waste, the removal of hazardous substances, and other remedial actions in connection with hazardous substances at the site.

SAB—State Allocation Board. This Board is responsible for determining the allocation of State resources used for the new construction and modernization of local public school facilities, and is the policy level body for the programs administered by the OPSC.

SDC—Special Day Class. Classes that have individuals with exceptional needs, either severe or non-severe and is referenced in Section 1859.42 of the SFP regulation.

SFP—School Facility Program. This State facilities program was initiated under the provisions of the Leroy F. Greene School Facilities Act of 1998.

DSA Fees
You Can Estimate Them Yourself

When your school plans are ready to go to Division of State Architect (DSA) for review, there are fees charged for this service. These fees are based on the estimated construction cost of your project. "Estimated construction costs" include construction management costs, but do not include design, inspection and testing costs. The DSA Web site provides information on how these fees are calculated, and includes a calculator that computes these fees based on your input.

There are two types of fees charged:

- Structural and Fire & Life Safety review fee is calculated as 0.7 percent of the first $1 million of estimated construction cost plus 0.5 percent of the estimated construction costs in excess of $1 million. The minimum fee is $250.

  For example, if your estimated construction costs are less than $35,714.29, your fee is $250. Over that amount, but under $1 million, your fee is 0.7 percent. Over a million your fee is $7,000 plus 0.5 percent of the amount over $1 million.

- Access Compliance review fee is calculated on a three tiered scale:

  - 0.2 percent of the first $500,000 estimated construction costs.
  - plus 0.1 percent on the portion $500,000 to $2 million.
  - plus 0.01 percent on the portion over $2 million.

  The minimum fee is $200.

  For example, your Access Compliance review fee would be $200 for any project estimated to cost under $100,000. Over $100,000, but under $500,000, the fee is 0.2 percent. Over $500,000 but under $2 million, the fee is $1,000 plus 0.1 percent of the amount over $500,000. Over $2 million, the fee is $2,500 (0.2 percent of the first $500,000 plus 0.1 percent of the next $1.5 million) plus 0.01 percent of the amount over $2 million.

This is all explained on the DSA Fees page on the DSA Web site, or at www.dsa.dgs.ca.gov/DSAFees along with an explanation of how "construction costs" are defined, and code references establishing the fees. Example calculations can be accessed from here, or can be found directly by going to www.dsa.dgs.ca.gov/DSAFees/feecalc.htm.

The DSA Web site also enables you to enter your own rough numbers so you can easily estimate the fees yourself. This calculator is located on the Project Tracking page, or directly at www.applications.dgs.ca.gov/dsa/eTrackerWeb/Calinput.asp.

Since DSA fees are assessed at the outset based on estimated costs, note that if the actual, final construction costs are determined to exceed the estimated costs by more than 5 percent, additional fees may be due at the conclusion of the project.

Investment Tips

Retrofit Lighting
Convert T12 lights and magnetic ballast to T8 lights and electronic ballast. Install occupancy sensors, which can reduce lighting costs by up to 40 percent. Convert hallway and non-public security lighting to energy saving 25-watt T12 bulbs. Convert TV surveillance cameras to newer equipment, which may not require floodlighting.

Install Efficient Lighting
There are a number of low-cost solutions that schools can invest in to make its lighting much more efficient and save money in the long run. For example: replace incandescent bulbs with compact fluorescents, which can last up to ten times longer; upgrade fluorescent lighting fixtures to high efficiency equipment; replace incandescent lights in exit signs with LED fixtures. This can reduce operating costs of these signs by up to 95 percent.

Think Green
Think carefully about using "green" design features. Use evaporative cooling wherever possible. Attempt to use natural ventilation and light surfaces. Encourage day lighting of interior spaces in the design. Surround all buildings and cover parking lots with trees to reduce local environmental temperatures. Specify light colored aggregates for local access road and sidewalk pavements.

Flex your Power

For more energy saving tips, incentives, and information on how you can conserve energy and save money, go to the Flex your Power Web site at www.ca.gov/state/fyp/fyp_homepage.jsp or the DSA Sustainable Schools Web site at www.sustainableschools.dgs.ca.gov/sustainableschools.

Re-Use of Plans May Equate to Cost Savings. . .

3 to 5 percent in construction costs. The realized savings can be attributed to substantial savings in contingency costs.

The process of developing school facilities that enhance the students' educational experience directly relates to architectural creativity. There is some reluctance in plan re-use due to fears that duplication would preclude architectural creativity. Conversely, by re-using plans, a greater degree of the architect's creativity could enhance the development of the educational facilities, creating the desired educational ambiance and environment to serve educational processes, and increase sustainability components.

Re-use of plans can also apply to individual buildings such as gymnasiums, multipurpose rooms and classroom modules. School districts can also develop plans for several types of buildings for different uses. Buildings of different sizes, styles, and functions can be approved in advance. A design using these pre-approved plans can incorporate the right size and types of buildings for a complete campus. If another school district likes some of the designs, an agreement can be crafted to re-use these plans.

Schools may wish to consider using prototypes and the PC process as they plan their program and retain architects.

See our feature project insert for more information on actual reuse of plans by a district. Also see many examples in the OPSC publication "Best Practices Report," featured in the article on page 11.

Sustainability, Creativity, and Cost-Savings

"High Performance", "Green" and "Sustainable" are interchangeable terms used to describe buildings that incorporate indoor environmental quality (energy, water, and materials efficiency), transportation, and siting considerations into their design to create buildings that have the least environmental impact and provide the best service to their occupants.

Perception vs. Reality

High performance schools are often perceived as more expensive and sustainability is perceived as high price tag "add-ons" such as solar panels, costly irrigation systems, or under floor air distribution. Coupled with government and utility incentives, high performance schools can reduce costs in the short term and provide maintenance and operations savings far into the future.

The key to achieving high performance schools at lower initial costs is to ensure that the project team is informed about high performance school design and criteria. Project team members can review the information on DSA's Sustainability Web site (**www. sustainableschools.dgs.ca.gov/sustainableschools**) or visit the Collaborative for High Performance Schools (CHPS) Web site (**www.chps.net**).

An informed and collaborative team can realize substantial initial cost savings. One such example is Marin County's Ross School. By using appropriate passive cooling design, the school's entire air conditioning system was eliminated. Without communication between the architect and the mechanical engineer, money could have been unnecessarily expended on an oversized HVAC system.

Savings-by-Design (**www.savingsbydesign.com**), a public goods program administered through local utilities, can help by providing free design consultation and cash incentives for energy efficient design. For information on other energy efficiency incentives programs, waste reduction, and other high performance features, visit the Division of the State Architect's Sustainability Incentives web page at **www. sustainableschools.dgs.ca.gov/sustainableschools/financing/incentives.htm**.

Sustainability inherently focuses on long term management. Because of this, school districts investing in high performance schools will find many long-term savings provided though reduced energy and water consumption, and operations and maintenance costs. Other long term benefits of high performance schools will be realized such as better indoor air quality (keeping teachers and students healthier), and increased daylighting improving the school's overall learning environment.

For additional information about this program, please contact:

Panama Bartholomy, DSA Environmental Affairs Analyst
panama.bartholomy@dgs.ca.gov
916.445.4229

Best Practices Report

The Office of Public School Construction (OPSC) presented a report at the March 2003 State Allocation Board meeting regarding a variety of methods and best practices of school facility construction. This report is a great resource when planning your projects.

The OPSC produces and frequently updates many comprehensive sources of information to support and guide school districts and other stakeholders as they build and retrofit schools. These OPSC resources contain the fundamentals as well as detailed information for the skilled practitioner. The user-friendly resources range from the basic overview and introductory information for small school districts and first-time applicants to the hands-on instructions for every aspect of planning, site selection, design, plan approval, program funding, school construction, and reporting requirements.

The report included a sampling of resources that address various strategies and best practices for school facility construction.

- **Public School Construction Cost Reduction Guidelines**
  Various strategies and best practices for construction of new, or modernization of existing facilities.
- **Cookbook for Energy Conservation Measures**
  General energy efficiency techniques and methodologies for new construction or modernization and has an immediate effect on energy savings and costs.
- **School Facility Program Guidebook**
  Information that assists school districts in applying for and obtaining "grant" funds for the new construction and modernization of schools.
- **Breaking Ground Excerpts**
  Three feature projects, complete with photographs, site diagrams and project data, that illustrate the latest school facility planning ideas and design solutions from the OPSC/DSA joint newsletter Breaking Ground.
- **Prototype School Designs**
  From the OPSC Web site, various plans for elementary, middle and high schools that includes: architect contacts, plan abstracts, construction data, program data, database search, school contacts, floor plans, site plans, and photographs
- **Plan Reuse Examples**
  Photographs and facts from three districts related to multiple schools built with the same architectural plans.
- **Developer Built Schools**
  Information about and examples of projects utilizing this delivery method.
- **Design-Build Schools**
  Information about a procurement process in which both the design and construction of a project are procured from a single entity that includes excerpts from the California Department of Education's Design-Build Projects Guidelines.

In addition, the report included the results of a survey of school districts and county offices of education that received Proposition 1A State Bond funding for more than one project at the same grade level to determine if they reused plans or used other methods to expedite their applications for funding.

The Best Practices Report, which includes these survey findings, may be viewed on the OPSC Web site in the Quick Links section.

You can locate the above-mentioned resources the OPSC Web site at www.opsc.dgs.ca.gov.

Resources

Web Sites

Office of Public School Construction ..... www.opsc.dgs.ca.gov
Division of State Architect ..... www.dsa.dgs.ca.gov
California Department of Education ..... www.cde.ca.gov
Department Toxic Substance Control..... www.dtsc.ca.gov
Resources Agency ..... ceres.ca.gov/ceqa/guidelines

Related Regulations

California Environmental Quality Act, Sections 15000–15387
California Health and Safety Code, Section 25356.1.
California Education Code, Section 17210(g) and (h)
Title 24 of the California Code of Regulations

Site Cost Regulations

New Construction Additional Grant for Site Acquisition and Development Costs are located in the SFP regulation sections:

1859.74 ..... New Construction Additional Grant for Site Acquisition
1859.74.1 ..... Site Acquisition Guidelines
1859.74.2 ..... New Construction Additional Grant for Hazardous Waste Removal
1859.74.3 ..... New Construction Additional Grant for Incidental Site and Hazardous Waste Removal for Leased Sites
1859.74.4 ..... New Construction Additional Grant for Hazardous Waste Removal Required on an Existing School Site
1859.74.5–1859.75.1 .... New Construction Additional Grant for District-Owned Site Acquisition Cost thru Separate Site Apportionment for Environmental Hardship
1859.76 ..... NCAG for Site Development Costs

The OPSC/DSA Connection to California School Districts

Breaking Ground

State of California
Gray Davis, Governor

State and Consumer Services Agency
Aileen Adams, Secretary

Department of General Services
William J. Jefferds, Ed.D., Director
Deborah Hysen, Chief Deputy Director
Jacqueline Wilson, Deputy Director

Division of the State Architect
Stephan Castellanos, FAIA, State Architect
Roy McBrayer, Deputy to the State Architect

Office of Public School Construction
Luisa M. Park, Executive Officer
Karen McGagin, Deputy Executive Officer

State Allocation Board
Luisa M. Park, Executive Officer
Bruce B. Hancock, Assistant Executive Officer

FEATURE PROJECT
OPSC WEB PLAN NO. 10006

kindergarten–sixth grade
1,100 students
36,092 square feet
$3,545,000
completed in 1998

REUSE OF PLANS

Union House Elementary School

Elk Grove Unified School District • Elk Grove, California

The design intent for this elementary school was to recall playful geometric elements such as the building corners and the round windows in the Kindergarten classrooms.

Planning and Design

Traditional planning concepts were employed for this school, with the added program requirements of Science and Computer Instruction, unusual for an elementary school of this vintage. The district chose to eliminate covered walkways in order to reclaim area for the added program needs.

The buildings are organized around a central court that provides an outdoor seating area for assemblies for the entire school, focusing on an outdoor stage with connections to the indoor stage in the Multipurpose Room. All the spaces between buildings are fenced to provide security to the interior of the campus.

PROGRAM SUMMARY

Superintendent
David Gordon

School Contact
Constantine Baranoff, Assistant Superintendent
Union House Elementary School
7850 Deer Creek Drive, Sacramento, CA 95823
916.686.7711

Architect
Stafford King Wiese Architects
622 20th Street, Sacramento, CA 95814
916.443.4829
Contact: ..... **Brian Wiese, President**
E-mail: ..... **mail@skwaia.com**
Web site: ..... **www.skwaia.com**

ARCHITECTS
STAFFORD
KING
WIESE

Site and Construction Details
Site Acreage: **9.722**
Number of floors: **1**
Cost per square foot: **$99.75**
Roof type: ..... **Fiberglass Cap Sheet**
Heating & Cooling: ..... **Package Roof-Top**
Construction type: ..... **V**
Number of times design was used: **5**
Construction time: ..... **14 months**

Consultants

Structural Engineer:
Barrish, Pelham & Partners
211 Lathrop Wy, Suite A, Sacramento, CA 95815

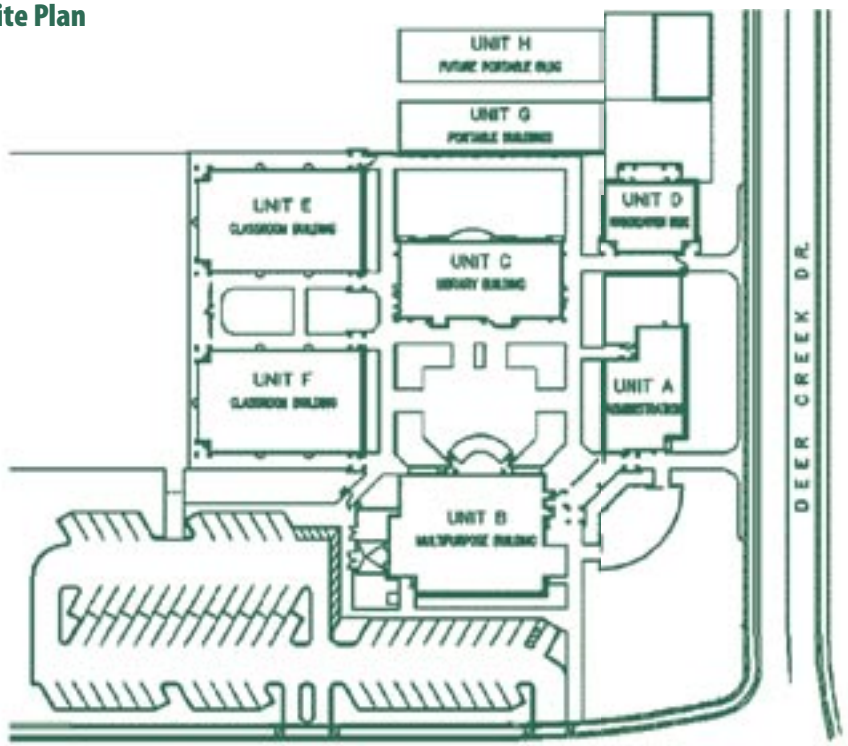
Mechanical Engineer:
Stecher-Ainsworth-Miner
3741 Business Dr, Sacramento, CA 95820

Electrical Engineer:
Koch, Chun, Knobloch & Associates
7300 Folsom Blvd, Sacramento, CA 95826

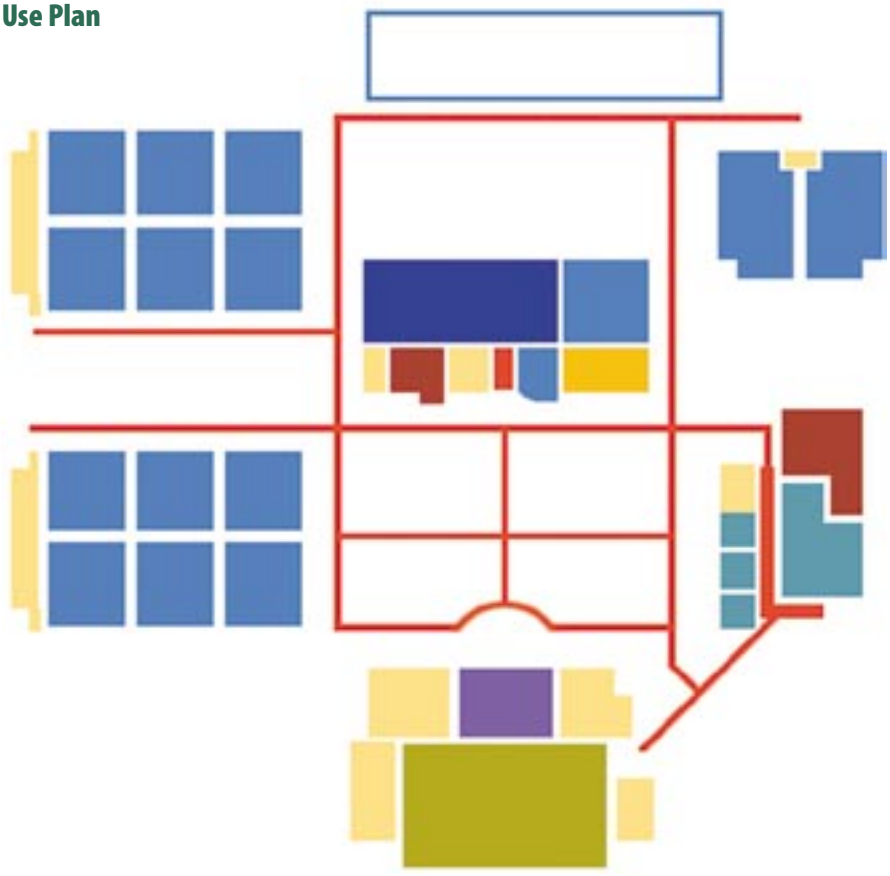
Landscape Architect:
MTWgroup
10411 Old Placerville Rd, Sacramento, CA 95827

Photographer:
Steve Simmons
2774 Harkness St, Sacramento, CA 95818

Site Plan



Use Plan



Plan Key

- Administration/Office
- Art
- Class Room
- Commons/Cafeteria
- Corridor
- Library, Media Center
- Music, Theater
- Physical Education
- Science Lab
- Teacher Resource
- Team Resource
- Technology, Shop
- Support/Utility